

2005 AMERICAS CLUSTER CITIES MEETING  
**“Disaster Risk Reduction in Metropolitan Regions through the  
Cluster Cities Project”**  
October 12-14 Bogotá, Colombia

*Organized by*  
Earthquakes and Megacities Initiative  
Dirección de Prevención y Atención de Emergencias,  
Alcaldía Mayor de Santa Fe de Bogotá, Distrito Capital,  
Secretaría de Gobierno

**Workshop Report**

**Introduction and Objectives**

The 2005 Americas Cluster Cities Meeting took place in Bogotá, Colombia from 12-14 October 2005. This was the seventh meeting of the Americas Cluster, which includes the cities of Santa Fe de Bogotá, Mexico City, Los Angeles, and Quito, and partnering academic institutions of Universidad de Los Andes, Bogotá; Universidad Nacional Autónoma de México (UNAM) and El Colegio de México, both of Mexico City; Escuela Politécnica Nacional (EPN, Quito); and Southern California Earthquake Center (SCEC), University of Southern California (USC), Los Angeles. The Ciudad de Lima, Peru also participated in this meeting as an “Observer” city. The list of fifteen international attendees of the meeting is provided in Appendix A. The Workshop was hosted by the Dirección de Prevención y Atención de Desastres (DPAE), Alcaldía Mayor of the Ciudad de Santa Fe de Bogotá at the Hotel Capital in Bogotá. This year program adopted three themes:

**Theme 1 (Central Theme): “Planning, Recovering and Rebuilding after a Major Earthquake”.**

**Theme 2: Integration of information and communication technology (ICT) into disaster management and disaster risk reduction.**

**Theme 3: Risk communication, community participation and community preparedness.**

This workshop reported on progress that had been made in each city since the March 2004 Workshop in Los Angeles, as well as interactions among the themes.

**Objectives of the meeting:**

1. To share knowledge, learn from past experiences, and understand key factors related to the planning, recovery and reconstruction after a major urban disaster;
2. To provide current reports of the disaster management (**DM**) strategies adopted in each of the four cities and progress to date;
3. To identify both the impediments to, and the mechanisms for, the implementation of the disaster risk reduction (**DRR**) measures in each city;
4. To report on the progress of EMI's **3cd Program** and to advance its core relationship with the Americas Cluster Cities Program (**CCP**).

## **Proceedings**

The Workshop opened on Wednesday morning, October 12, 2005 with a tour of the seismic risk areas of the city of Bogotá. Staff from DPAE accompanied the group and explained both the level of seismic risk in various zones of the city and the steps that had been taken by DPAE to reduce those risks. The tour showed the vulnerability issues related to colonial era buildings in the historical center of the city (Candelaria) and the difficulties associated with the potential seismic retrofit of these historical buildings; sites of the microzonation study conducted by DPAE in collaboration with scientists from Universidad de los Andes were also observed by the group and explained by the technical representatives of DPAE. The guides from DPAE also indicated the types of construction that characterized the buildings in the city. These types ranged from new construction built on sound principles of disaster resistant design to the extensive problem of informal housing that has been increasing as the population has grown with a significant rate of immigration to the city from rural sectors of the country. Dealing with informal housing represents a significant challenge for the city. Representatives from other cities indicated a similar situation in their cities and exchanged information on the approaches their cities are undertaking to deal with informal housing

Following the city tour, Mr. Juan Manuel Ospina, Government Secretary, City of Bogotá, hosted the group of Workshop participants to a welcoming luncheon at the Hotel Capital. After the welcoming speeches and a gracious luncheon, the participants entered into the substantive sessions of the Workshop.

The participants of the Americas Cluster Cities Project are familiar with the conditions in each of the cities, having held six prior meetings and undertaken several bilateral and cluster-wide cooperation programs. Hence, the presentations and discussions focused directly on the issues and themes of the workshop. The discussions included the perspectives of the different cities on disaster risk reduction and the strategies enacted for different degrees of exposure to seismic risk in different sections of their respective metropolitan regions.

### **Summary of the Workshop Deliberations and Recommendations**

#### **Theme 1 (Central Theme): Planning, recovering and rebuilding after a major disaster**

Four presentations were given related to this topic. Most relevant was the one given by Mr. Manuel Aguilera, who addressed the process of reconstruction of the housing sector after the Mexico Earthquake of 1985. Mr. Aguilera led this operation for 18 months before becoming the Acting Mayor of Mexico City. He conveyed his experience, covering not only the technical issues associated with the reconstruction, but all other relevant issues related to governance, finance and socio-political. He pointed out that the latter are the most complex to deal with and require real-time planning and analysis. Mr. Aguilar presentation gave a vivid illustration of the complexities of the issues involved in compensation of victims and in reconstruction of neighborhoods of Mexico after the earthquake. Legal issues such as property ownership, tenants versus owners, dwelling living area, and respect of urban zoning and urban tissue interact with the political and social pressures to provide housing as soon as possible to the victims. Twenty years later there is still evidence of the significant impact that this earthquake had on the city. However, overall careful due process has avoided many mistakes and time has shown that the reconstruction did not add to the vulnerability of the city.

These issues were also faced in Turkey after the 1999 Marmara Earthquakes (as reported by Metin Ilkiskik), and were witnessed in other earthquakes such as the 2003 Boumerdes Earthquake in Algeria

and more recently the 26 December 2004 Sumatra Earthquake and tsunami in Indonesia. In relation to the latter, Fouad Bendimerad reported on the current situation in Banda Aceh, where the lack of soil data and topographical data is impeding the rational planning of the reconstruction process in the affected area. The importance of having microzonation studies for urban areas performed and integrated in urban planning was noted as an important disaster preparedness measures for cities. Such studies could significantly speed up the recovery and reconstruction process because they would delineate the levels of hazard in the city and also provide critical information for design of lifelines and for foundations of important facilities and multi-story buildings. The participants noted the importance of including local communities in the development of reconstruction plans for the region. Without local knowledge, the plans are unlikely to be effective, and adversarial conditions typically present between authorities in charge of the reconstruction and the victims could worsen. For example, in Banda Aceh there are significant technical and scientific resources at the Shyah Kula University that could be more effectively used in the reconstruction process, and provide critical local input to reconstruction plans. A reconstruction plan needs that is understood, accepted, and implemented at the local level is likely to be more sustainable and to provide more protection against future disasters. Acknowledging the importance of local involvement and finding strategies to engage communities in the design of reconstruction processes is an important component that needs to be included in viable disaster risk reduction plans.

Recognizing that cities learn from a critical review of failed practices in disaster response operations, Ellis Stanley, Director of the Emergency Preparedness Department, City of Los Angeles, reported on the failures in policy and practice that characterized the response to Hurricane Katrina in the City of New Orleans, Louisiana. Mr. Stanley noted the importance of the Port of New Orleans to the economy of the US, but the indifference to risk from the vulnerable conditions of the city's geographical location and physical characteristics interacting with an aging civil infrastructure, insufficient preparedness programs, and the declining social and economic capacity of its residents. The result was a cumulative degradation of the city's capacity to withstand the likely consequences of a Category 4 hurricane and inability of the city to mobilize an effective response system that included assistance from regional, state, and federal levels of government. The consequences were enormously costly for both the city and the country and revealed serious errors in emergency management planning and practice.

### **Conclusions and lessons derived from theme 1 discussion**

1. Digital and accurate documentation on the geographical distribution of the hazards in the city, including knowledge of soil data, topographic data and urban zoning and land-use data is important in speeding up the reconstruction after a major disaster
2. Involvement of local experts and participation of the local community are essential components in planning a sustainable reconstruction;
3. Legal, social, and technical issues related to the reconstruction could be very complex, developing good information on housing, including number of occupants and number of families living in each dwelling could simplify the process of compensation; further urban tissue of neighborhoods need to be preserved in the reconstruction process.
4. Public information strategies and dialog with victims are essential component of effective recovery and reconstruction planning.
5. Continuing training and practice of the city's emergency plan among by responsible agencies are fundamental for building capacity for effective post-disaster action.

## **Theme 2: Integration of information and communication technology (ICT) in disaster management and disaster risk reduction**

ICT continues to be developed and used extensively by all four cities in the context of DM and DRR. Technologies such as GIS (Geographical Information System) and communication technologies such as multi-band radio frequencies and cell phones are now integrated into daily operations in emergency management in each of the cities. Increasingly, these technologies are being applied to support risk assessment and used to design programs that address specific problems of disaster risk reduction. This development illustrates the growing maturation of ICT as the cities incorporate the cumulative knowledge gained regarding disaster risk in their respective cities into their action plans for disaster risk reduction.

Three substantive areas of discussion demonstrated the constructive use of ICT in disaster risk reduction. They include:

1. Linkages between the CCP and EMI's 3cd Program
2. Strategies for strengthening capacity for response to disaster
3. Illustrations of the constraints incurred in response to recent disasters that lacked appropriate uses of ICT, e.g. the Sumatran Earthquake and Tsunami in Banda Aceh, Indonesia and Hurricane Katrina on the U.S. Gulf Coast

The integration of ICT into disaster risk reduction serves as a core linkage between the Cluster Cities Program and EMI's 3cd Program. Jeannette Fernandez, Coordinator of Component 1, 3cd, summarized the objectives of the 3cd Program and reported on the progress made in two key areas. First, the program is creating a Megacities Knowledge Base of sound practices in disaster risk reduction undertaken by partner megacities in the CCP. All twenty cities participating in the CCP were sent a questionnaire asking them to identify sound practices in disaster risk reduction that had been enacted in the context of their respective cities. Seven cities responded with concrete information, which the 3cd Team validated and completed. This knowledge base now has 27 sound practices. Ten of these practices came from Metro Manila, which also reflects the time and engagement of EMI staff members with city officials in that megacity to identify and validate disaster risk reduction activities that constitute sound practice.

Second, the 3cd Program is developing a demonstration MapViewer project in ARCIMS that can be used as a template by member cities to communicate and share information on risk with relevant stakeholders in their respective cities. The current model has been developed in reference to Metro Manila, and consists of GIS layers that show critical facilities for the city, but overlay these layers with areas of local hazards, e.g. flood plains and zones of seismic risk. A major function of the MapViewer is to develop a common set of terms used in disaster risk reduction that are applicable across languages and cultures. Both of these 3cd products are basic tools for disaster risk reduction that can be adapted by CCP member cities for their own use. The products serve as vehicles for sharing information about strategies of risk reduction that have been validated in other cities. The cities have been encouraged to use the Knowledge Base and to provide feedback.

The city of Bogotá is using ICT in innovative ways to implement its strategic plan for strengthening capacity for response to disaster. Partially funded by UND, the program includes the development of an action plan to focus on three key objectives over the next four years. These objectives are: a) to strengthen capacity for response operations for the city; b) to identify the specific vulnerabilities of different districts of the city in reference to its geographical hazards, built construction, social and economic characteristics and prepare appropriate DRR strategies for each district; and c) to integrate the district level strategies in ways that cumulatively strengthen the response capacity of the whole city.

Four key components are included in Bogotá's action plan: 1) a logistics system to support rapid mobilization of response units throughout the metro region; 2) a communications system, including the identification of all radio networks for each district and the capacity of each operations unit; 3) a city-wide information system that has basic information for each district of the city and for managing international donations and norms for participating in response operations; and 4) a public education strategy to raise citizen awareness of seismic risk at the district level, particularly in reference to district-level construction practices. When asked what had been the degree of interaction between the city and the national government in the development of the DRR plan for this capital city, Fernando Ramirez, director of DPAE, responded that President Uribe and the political leaders of Colombia have been very supportive of the city's plan. His next task will be to engage the support of the business leaders of Bogotá, which serves as the center of commerce for Colombia. Bogotá's progress in addressing its seismic risk was noted as an example to follow for other cities facing similar risks. Other cities in the Americas Cluster – Mexico City, Quito, and Los Angeles – are developing GIS and modeling capabilities to assess risk and explore alternative strategies for setting priorities for risk reduction activities, given significant risk but limited budgets. ICT is proving to be an essential tool for emergency managers in planning and executing their DRR action plans.

#### **Conclusions and lessons derived from theme 2 discussion**

1. ICT represents a major investment by cities as they develop their DRR strategies
2. Financial support from international organizations helps overcome the financial limitations experienced by cities and help them implement a comprehensive program of DRR that incorporates ICT as a core component. Current EMI Megacities Knowledge Base could serve as a platform for information sharing between the cities as well as a resource.
3. As cities mature in their proficiency in using ICT, they build cumulative knowledge bases regarding disaster risk that inform their priorities and action plans
4. Informed DRR actions at the city level attracts attention and support from national level policy makers

#### ***Theme 3: Risk Communication, Community Participation and Community Preparedness***

Significant advances were reported by member cities in their approaches to risk communication and engagement with their communities. For example, the Southern California Earthquake Center in Los Angeles represents a consortium of 15 core institutions, with 40 additional participating universities, engaged in a systematic program of research to explore and identify seismic risk in the Los Angeles region. This collaboration has led to a strategy of software development termed "Open Seismic Hazard Analysis" in which participating researchers build a cumulative knowledge base regarding seismic risk in the region and report the status to city administrators.

Other examples include the model of community risk assessment between the city of Istanbul and Turkish universities and research institutions known as the Zeytinburnu Project, and the systematic implementation of the disaster risk indicators program in Bogotá led by researchers from Universidad de los Andes working in collaboration with staff at DPAE. Mexico City has similarly established an innovative program in conjunction with researchers at UNAM and El Colegio de Mexico to assess the city's exposure to seismic risk and to estimate the organizational requirements needed to respond appropriately to seismic events of different magnitudes. Quito is engaged in a collaborative project with researchers from EPN on monitoring the activity of volcanoes in the metropolitan region and providing current information regarding risk to residents of the threatened

areas. Such programs demonstrate the value of building linkages between local research institutions and city officials responsible for disaster risk reduction and the consequent incorporation of scientific knowledge into practice.

The tasks of communicating risk to community residents and engaging their participation in disaster risk reduction activities represent a continuing challenge to the cities, as both populations and risks change over time. Several innovative examples discussed at the Workshop included a range of methods of communicating risk to community residents developed by DPAE in Bogotá and the models of sound housing reconstruction following the 1985 earthquake in Mexico City.

A regional initiative for extending the concepts and practice of disaster risk reduction throughout five nations in Andean region was reported by Ana Campos, coordinator for Disaster Risk Management Project for the countries in the Andean Region ( Comunidad Andina de Naciones , CAN). This initiative, supported by the European Union on, includes disaster risk management as a central component of its economic and social development program in five Andean nations – Colombia, Venezuela, Ecuador, Peru, and Bolivia. This shared mission provides an opportunity to develop a collaborative program with EMI that includes a focus on DRR in the megacities of these five nations.

### **Conclusions and lessons derived from theme3 discussion**

1. Cities can draw significant expert resources from their local universities and integrate local knowledge efficiently in their DMM practices by building collaborative agendas with their local universities and research institutions as demonstrated by the Cluster Cities Project.
2. Multiple methods of communicating risk are essential for effective public education in cities with populations that have varying levels of economic capacity, social organization, and education.
3. Developing collaborative relations among megacities in the conduct of DRR programs can extend the practices of DRR and DRM to wider regions of risk.
4. The concept of Disaster Risk Management Master Plan (or DRMMP) used by the 3cd Program can serve as a method of setting priorities and developing a comprehensive disaster risk reduction for the city.

### **Mechanisms for Cooperation among Cities in the Americas Cluster Cities Project**

Advancing mechanisms of continuing cooperation and information exchange among the Americas Cluster Cities partners was discussed in the concluding session of the Workshop. Developing a web-based capacity for accessing, exchanging, and updating information on current practices in each city was acknowledged as an important mechanism to facilitate cooperation and learning among the member cities. This capacity would support a cumulative regional knowledge base regarding disaster risk reduction in the Americas Cluster, and also facilitate the conduct of specific partnership projects among the cities. Further outcomes from the meeting include:

### **Mechanisms for Cooperation**

1. EMI proposed the allocation of one EMI intern to each Cluster City to serve as a liaison between the local university researchers and the city officials and to assist in data collection and updating of a citywide knowledge base for DRR
2. Pedro Kuljevan, representative from Lima, Peru, agreed to request the Mayor of Lima to consider Lima's participation in EMI as a full member city
3. Ana Campos, representative from the Disaster Risk Management project for the Andean Nations (CAN), agreed to request consideration of a partnership with EMI in conducting DRR programs in member nations
4. The representative of the Municipalidad de Quito invited the partners to hold their 2006 meeting in Quito in June, continuing the tradition of rotating the meeting venue among the four Cluster Cities

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More information on the Cluster Cities Project is available on the EMI Website: [www.earthquakesandmegacities.org](http://www.earthquakesandmegacities.org) .

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